

## **VALUE CHAIN RISK ANALYSIS FOR SMALL HOLDER TEA FARMERS IN KIAMBU COUNTY-KENYA**

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### **Abstract**

*Agriculture, especially small holder farming is characterized by a high variability and unpredictability of many factors. Small holder tea farmer's risk is associated with unpredictable circumstances which determine the final output, value and cost of tea production process. The study aimed to investigate the influence of risk management on effectiveness of value chain financing in Kiambu County, Kenya. For this, a cross-sectional study of 384 smallholder farmers who supplied tea to 6 KTDA factories was conducted. A total of 354 respondents were interviewed: 234 (66%) males and 120 (34%) females. The mean number of years the respondents had been planting tea was 12.5 years (SD 6.3 years). The median amount of loan taken was 114746.38 (IQR KES 0 – KES 5,000,000). The most preferred lenders by the respondents were SACCOs (64%) and banks (57%) followed by chamas (45%). A third (33%) of the study participants cited friends and relatives as their preferred source of seeking financial support. Very few respondents (5%) had received financial support from NGOs while shylocks (7%) were also not a preferred source of cash from farmers 79% cited high interest rates as a*

*stand-out factor that impeded the respondents to access credit facilities, 64% reported lack of collateral, 63% reported lack of information on credit facilities and 62% said the scale of their farming operations limited their access to credit facilities. The factor that least deterred farmers from accessing credit facilities was high transaction costs and risk of defaulting-both cited by 59% of the respondents. Intervention measures cited as possible risk mitigating mechanisms for farming operations were: combining tea farming with other agricultural activities like livestock or mixed farming was cited as the best risk mitigating factor by 83% of the respondents while 80% felt that better infrastructure like roads, utilities and storage facilities would cushion them against their operational costs. 75% and 74% of the respondents rated personal savings and credit facilities respectively as the best coping mechanisms. The least preferred coping mechanisms were sale of assets (49%) and production contracts (47%). The study concludes that more access to insurance should be prioritized to help smallholder farmers to manage risk, enhance investment, and foster the growth in farm productivity. The study shows that despite the various operational risks facing farmers, there is a serious lack of tailored formal and informal insurance mechanisms to help them mitigate against the many risks that face them*

*Keywords: Tea Farming, Small Holder Farmer, Value Chain, Value Chain Financing, Risk Management, Kenya*

## **INTRODUCTION**

Agriculture, especially small holder farming is characterized by a high variability and unpredictability of many factors such that farmers cannot predict with certainty or determine the have control of some factors the amount of output they will produce. Agricultural risk is therefore associated with unpredictable circumstances which determine the final produce, value and cost of any agricultural production process. Such risks could be caused by factors like weather variability, natural disasters, uncertainties in yields and prices, imperfect markets of financial services, institutional market forces and individual uncertainties. There are six different categories of risks involved in lending to agricultural sector: price risks, production risks, asset risks, institutional risks, human or personal risks and financial risks (Angelucci & Conforti, 2010). Small holder farmers in developing countries are more prone to agricultural risks due to their inability to plan, prioritize, prepare and to mitigate certain risks due to resource-limitations.

Financial products and services offered towards agricultural production by financial institutions still remain insufficient especially for smallholder farmers based in rural areas. Most of the financial providers in Kenya view farming as a high cost business that involves high risks. In all levels of the agricultural supply chain, financial investment is required particularly to poor

and food insecure areas. Financial investment in developing countries has had low results especially due to defaults even when there are incentives such as high subsidies. There has been low growth of agricultural development banks as a result of restrictive government rules and fear of venturing into small holder borrowers setups (Miller & Jones, 2010). The risks that arise in the agricultural sector are mainly from sudden price changes and unpredictable weather patterns that can happen in a whole region, thus making loan repayments at that time uncertain.

## RESEARCH METHOD

### Study Site and Population

The study was conducted in Kiambu County-located in the central region of Kenya. Agriculture is the main economic activity and leads in employment, food security and income earnings with around 304,449 people directly or indirectly employed in the sector. Apart from coffee and tea which are the main cash crops, other food crops grown like maize, beans, pineapples and Irish potatoes are also grown in small scale in the upper highlands of Limuru, Kikuyu, Gatundu North and South Constituencies within the county. The county also hosts branches of all the major commercial banks and micro finance institutions within its Kiambu, Thika and Limuru towns (Kiambu County, 2015). The county has 74,000 smallholder tea farmers supplying tea to 6 KTDA factories (KTDA, 2011). Informed consent for study participation was obtained from respondents who were residents of Kiambu County, practicing tea farming on small scale and not registered as a company. Ethical approval for the study was obtained from the United States International University Chandaria School of Business.

### Sampling

Farmers were sampled using a systematic random sampling approach. Every 10<sup>th</sup> farmer who was sampled and in instances where the 10<sup>th</sup> respondent did not meet the inclusion criteria or declined to participate, the next respondent meeting the inclusion criteria was selected and the 10<sup>th</sup> respondent interval restored. A total of 384 respondents were sampled in this study.

Table 1: KTDA managed Factories and Sample Size

| KTDA Factories | Number of Respondents |
|----------------|-----------------------|
| 1. Kambaa      | 61                    |
| 2. Kagwe       | 85                    |
| 3. Theta       | 70                    |
| 4. Kuri        | 45                    |
| 5. Gachege     | 56                    |
| 6. Mataara     | 67                    |
| <b>Total</b>   | <b>384</b>            |

## Statistical Analysis

Univariate analysis of small holder farmer risk profiles was conducted.  $\chi^2$  tests were done to compare differences between risk profiles and agricultural value chain among the respondents. Data were analyzed using SPSS Version 22 (Armonk, NY: IBM Corp. USA) and a  $p < 0.05$  value at 95% confidence interval was considered significant for all analysis.

## ANALYSIS AND RESULTS

### Farmer Profiles during Value Chain Financing Process

A total of 354 respondents were interviewed: 234 (66%) males and 120 (34%) females. The mean number of years the respondents had been planting tea was 12.5 years (SD 6.3 years), with 61% having planted tea for more than 10 years, 14% for less than 5 years and 25% for between 5-10 years. The mean acreage per farmer was 2 acres (SD 0.66 acres). 88% of the respondents cited tea as their main source of income while 11% and 1% listed formal employment and coffee as their main sources of income. 82% owned the land in which they were using for farming while 18% had either leased it or were temporarily using the land in which they carried out farming at the time of the study. At the time of the study, 77% said that they had taken a loan for farming purposes while 23% had never taken a loan. The median amount of loan taken was 114746.38 (IQR KES 0 – KES 5,000,000) The most preferred lenders by the respondents were SACCOs (64%) and banks (57%) followed by chamas (45%). A third (33%) of the study participants cited friends and relatives as their preferred source of seeking financial support. Very few respondents (5%) had received financial support from NGOs while shylocks (7%) were also not a preferred source of cash from farmers.

### Review of Value Chain Financing Processes

The farmers also self-evaluated some of the factors they felt banks gave a lot of consideration during the loan review process. In their opinion, the issue given most attention by banks during the borrowing/lending process was the farmer's ability to repay the loans especially the stability of the primary source of income (81%). On the other hand, the least issues given attention by banks were the farmers background especially their experience in tea farming (44%) and the amount of capital the farmers had invested in their farming businesses (41%). Two thirds (67%) of the respondents also felt that the bank paid special emphasis on the purpose for which the loan was being paid.

Individuals who had received bank and SACCO loans were further asked if the lending institutions monitored and controlled the disbursed loans. The respondents rated "formal written communication (76%)" and "repossessing of property given as security (68%)" when loans were

not paid as the times when lending institutions paid great attention or monitored disbursed loans. According to 67% of respondents, lending institutions did not give priority to visiting farms to see how the monies borrowed were being used while 41% reported that the banks would call them by phone when the loan was not serviced on time.

### **Factors Limiting Access to Value Chain Financing**

79% cited high interest rates as a stand-out factor that impeded the respondents to access credit facilities, 64% reported lack of collateral, 63% reported lack of information on credit facilities and 62% said the scale of their farming operations limited their access to credit facilities. The factor that least deterred farmers from accessing credit facilities was high transaction costs and risk of defaulting-both cited by 59% of the respondents.

### **Business Risk Management and Mitigation**

Results presented in Figure 1 show that, 85% of the farmers rated sudden changes and prolonged decline in output price as the highest operational risks to their operations followed by changes in weather patterns and foreign market conditions at 80% rating respectively. The least threats to the respondents' operations were transport failures (33%), pests and diseases (41%) and distribution failures (43%).

Access to insurance services and products was also assessed in the study: the respondents were asked to list some of the factors that limited their access to insurance. 76% of all respondents reported lack of information about available insurance services and products as the biggest impediment to accessing insurance; high costs of insuring and complicated insurance contracts were cited by 72% of the respondents respectively; 69% were felt that the (small) scale of their farming operations while 66% cited inappropriate insurance services and products in the market as factors that hindered access to insurance. Only 37% and 47% of the respondents felt that unwillingness of insurance companies to insure farmers and high operation risks were factors that hindered them from accessing insurance services and products.

The following intervention measures were cited as possible risk mitigating mechanisms for their operations (Figure 2). Combining their tea farming with other agricultural activities like livestock or mixed farming was cited as the best risk mitigating factor by 83% of the respondents while 80% felt that better infrastructure like roads, utilities and storage facilities would cushion them against their operational costs. 75% and 74% of the respondents rated personal savings and credit facilities respectively as the best coping mechanisms. The least preferred coping mechanisms were sale of assets (49%) and production contracts (47%).

Figure 1: Rating of Operational Risks

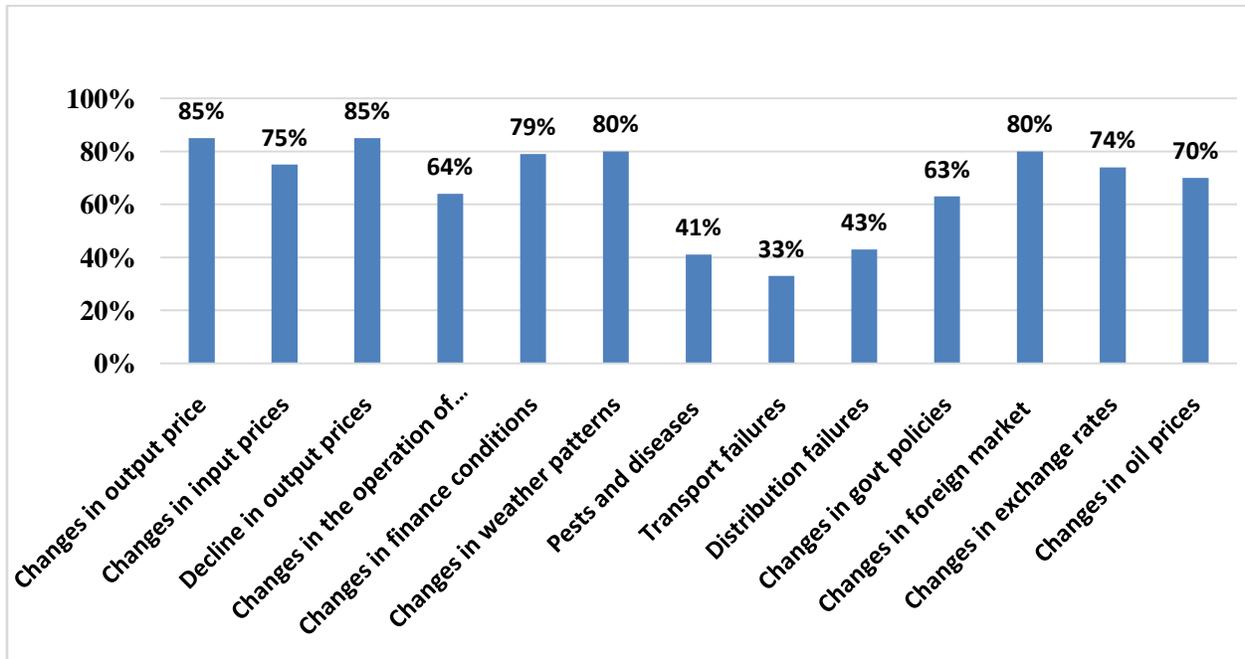
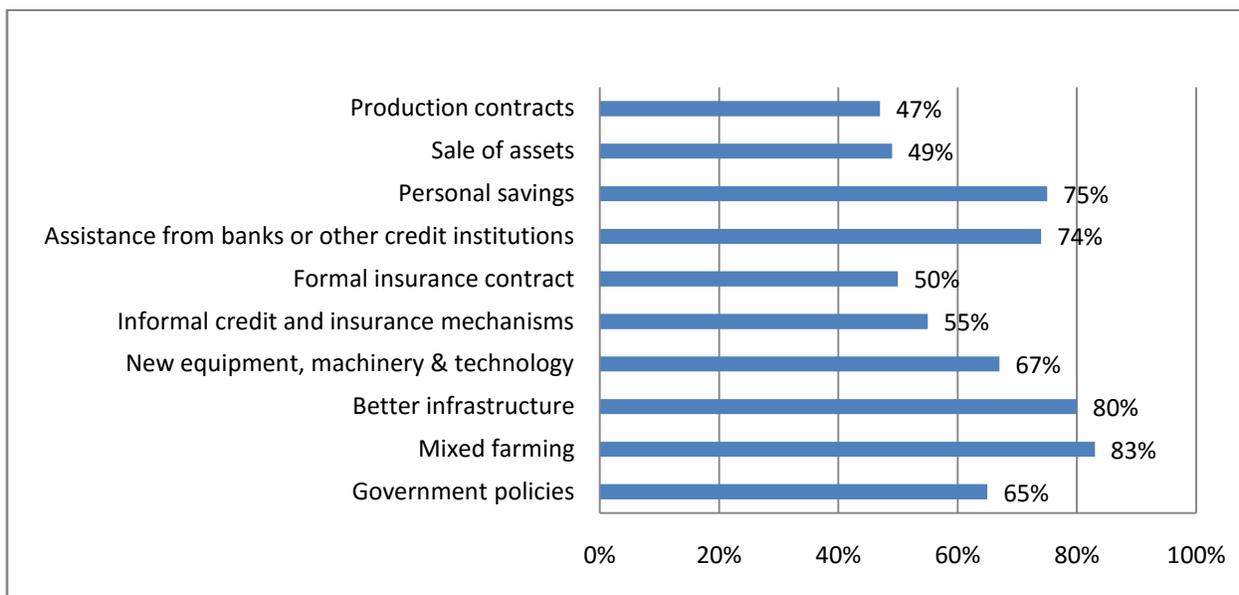


Figure 2: Risk Reduction Mechanisms



## DISCUSSION

Farming is a risky venture. Small holder farmers in tea industry are faced with many informal and formal risks. Generally farmers respond to these risks through informal (local arrangements between individuals or households, or groups as communities or villages) and formal (market-based activities and/or government provided) mitigating mechanisms.

Lekprichakul (2009) describes 2 coping mechanisms: *ex ante* (measures taken to avoid, transfer or reduce or exposure) risk management and *ex post* (measures taken after the shocks to mitigate or insulate the welfare impacts of the shocks) risk coping. The former is a long-term coping mechanism while the latter is a short-term survival adjustment.

In the current study, the most preferred lenders were SACCOs (64%) then banks and chamas (45%) and friends/relatives and did not prefer illegal money lenders (shylocks). The respondents in this also cited that the most critical factor the lending institutions considered during the loan application review process was the farmer's ability to repay the loans especially the stability of the primary source of income. The lenders also least considered the farmers background especially their experience in tea farming. Conversely, respondents in Ekasiba *et al's*(2014) study voluntarily cited fear of not repaying their loans as the reason they had not applied for loans/credit facilities. In this study, 6 of every 10 respondents (59%) also cited inability to repay loan instalments as a big reason for not accessing credit facilities. Even though the formal banking sector is well established, in her study aimed at reviewing the factors influencing smallholder dairy farmers' choice of agricultural credit in Githunguri Constituency, Wangui (2013) determined that most small holder farmers still prefer the "semi-formal" SACCO option due to its flexible payment methods and quick loan processing times (Wangui, 2013). Boucher *et al* (2007) and Lamberte *et al* (2006), also agree that the SACCO credit option is popular amongst smallholder farmers because they processed their loans quickly, were not stringent about collateral and were open to rescheduling their loan repayments to suit farmer incomes. These findings also concur with those of Mbugua (2012) who in his review of factors that determine credit access in Cherangany Constituency of Trans Nzoia County found that banks gave special attention to guarantee of loan repayment and collateral to secure the same. The results of this study show that the farmers cited many operational risks affected tea farming with sudden changes and prolonged decline in output price as the highest operational risks to their operations unpredictable weather patterns and foreign market conditions. Further, the stability of the respondent profits was only approved by approximately One third of total respondents pointing to a non-assuring operating environment.

Even though this study also shows that participants adopted mitigating factors against by supplementing tea farming with other agricultural activities like livestock or mixed farming was adopting utilities and storage facilities as well as personal savings, these measures are not stable and big enough to reassure lending institutions. These factors lead to lack of adequate collateral to support credit applications.

To make matters more complicated for the small holder farmers, they did not have access to insurance services and products due to limited access to insurance information, high

costs of insuring and complicated insurance contracts as well as non-flexible insurance products/services that did not explicitly address their needs. This environment is not suitable for credit from the formal lending sector as most financial institutions tend to lend to market segments with a stable and assured ability to repay loans (Kopparthi & Kagabo, 2012).

As a result, despite numerous government interventions to increase smallholder access to affordable credit, the formal lending sector has not met the credit demands.

## **CONCLUSIONS**

To reduce agricultural risks, Angelucci and Conforti (2010), suggest that mitigation strategies should be well designed. Such mitigation strategies may involve diversifying income sources, savings among other strategies. On the other hand, Miller and Jones (2010) suggest that secured markets, sales and production risks can be reduced through value chain approach. The author further noted different instruments that could be used to mitigate risks in agriculture sector. These instruments are, crop weather insurance, forward contracting and futures.

More access to insurance should be prioritized to help smallholder farmers to manage risk, enhance investment, and foster the growth in farm productivity. The study shows that despite the various operational risks facing farmers, there is a serious lack of tailored formal and informal insurance mechanisms to help them mitigate against the many risks that face them.

All stakeholders including the government and insurance companies should develop customized insurance services and products that are specific to small holder farmer needs like effective and comprehensive insurance coverage as well as efficient reimbursements during farmer claims.

## **LIMITATIONS OF THE STUDY**

The current study only assessed for small holder tea farmer risks as reported by them. It is possible therefore that some of the responses could be biased towards the farmer perceptions. The study did not carry out an analysis of the exact extent of the risks and the losses incurred by the farmers as a result of the exposure to the listed risk factors.

## **AUTHORS' CONTRIBUTIONS**

Musuva conceptualized and designed the study, conducted literature review, collected data and drafted the manuscript. Lewa and Achoki provided guidance on study design, reviewed the analysis and manuscript and provided key comments on manuscript revision. Luciani conducted cleaning of the data, data analysis and proof lead final manuscript. All authors read and approved the final manuscript.

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